

*Technical Report  
Westside Cities Subregion  
Livable Communities  
(Parking Subtask 3.A)*

*Prepared for:*

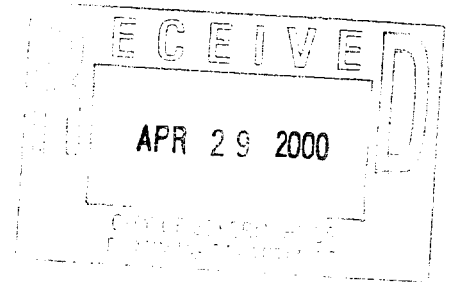
*Westside Cities Subregion  
& Meyer Mohaddes Associates*

*Prepared by:*

*Michael R. Kodama, Planning Consultants & Dr. Richard Wilson*

*April 20, 2000*

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# Westside Cities Parking Study

## 1. Introduction: How Parking Policy Can Support Livable Communities

*Livable Communities: "A shared community vision of pedestrian friendly, mixed use and transit oriented places scaled to people, not automobiles, and connected to vibrant civic and public spaces", SCAG's Livable Places Initiative*

This study is intended to help the Westside Cities assess their parking circumstances and provide information on potential parking management techniques or options that can enhance Livable City or Community concepts. The report describes methodologies and policy suggestions that may be a basis for policy consideration and in-depth feasibility studies by the cities. Included in the report are potential approaches to parking issues that can help facilitate Livable Community initiatives. Each city can assess the viability of these parking management techniques on a case by case basis.

Parking management strategies can be a powerful policy lever that influences both land use patterns and transportation demand, and therefore present opportunities for the Westside Cities to develop in a way that supports livable city concepts. The existing conditions in the study area are favorable to new parking approaches. They include:

- Dense transit network
- Pedestrian activity
- Support and precedent for denser and mixed-use development
- Strong impetus to reduce traffic congestion
- Market-driven parking pricing

In addition, parking policy concepts that support livable communities may be more consistent with developers' interests and urbanized Westside market forces, as opposed to conditions in suburban communities. However, in considering Livable Community related concepts, it is clear each city has its own specific parking issues and that local implementation will require future detailed local studies.

This report focuses primarily on issues related to parking requirements. Certain types of minimum parking standards can affect the implementation of livable community development concepts. For example, if parking requirements require more parking than is actually needed, they can unnecessarily increase development costs, lower density and discourage mixed-use development. Inappropriate parking requirements can

undermine otherwise well-crafted livable community policy. They do so by increasing land development costs, providing incentives for single occupant vehicle (SOV) travel, and affecting the quality of urban design. Livable communities require a more sophisticated approach to parking. Such an approach can be distinguished by requirements that are closely tied to parking demand characteristics designed to use parking management tools and shared parking resources.

This study provides the following:

- Summary of city characteristics, current conditions, including parking codes in each city, and each city's policy framework for parking.
- Analysis of parking techniques to support livable communities. This section reviews strategies such as demand-based requirements, in-lieu parking fees, clustered and shared parking arrangements, on-street and off-street parking and relevant parking pricing issues.
- Analysis of parking needs for residential, office, retail and light industrial uses. This analysis takes the form of a parking management calculation toolbox that provides cities with a basis for making specific parking requirement determinations. It also illustrates the application of shared parking strategies.
- Analysis of compact parking spaces (parking space size and design regulations).
- Information to support the implementation process.

## 2. Review of Existing Conditions

Existing conditions in the study cities are favorable to new parking approaches. The four study area cities, Beverly Hills, Culver City, Santa Monica and West Hollywood, when compared to the rest of the region, have a relatively dense transit network, higher-than-average pedestrian activity, and support and precedent for denser and mixed use development. There is a strong impetus to reduce traffic congestion and a precedent for market-driven parking pricing. Local market conditions in the urbanized Westside area indicate that using parking policy to support livable community concepts may be more consistent with developer interests.

The project relied on local cities to provide existing data on parking regulations, parking utilization rates and parking pricing.

### A. Westside Cities Characteristics

The *Mid-City/Westside Transit Corridor Study* (LACMTA 2000) provides an analysis of the transportation characteristics in the Mid City-Westside study area. That study area included the four cities that are the subject of this study as well as portions of the City of Los Angeles and unincorporated Los Angeles County. Despite the larger study area, the study provides a valuable picture of demographic and travel characteristics that set the context for new approaches to parking requirements.

The LACMTA study (2000) indicates the area is a jobs-rich high density portion of the region. It accounts for 16 percent of the population and 24 percent of the jobs in Los Angeles County. The population density of 13,883 persons per square mile is over 6 times the 2,300 persons per square mile figures for Los Angeles County. The job density of 9,167 employee per square mile is almost 9 times the county job density of 1,070 jobs per square mile. Population is expected to grow by 19 percent by 2020 and jobs are expected to grow by 15 percent by 2020 (SCAG 1998). In short, this is a high-density, high-growth area that will experience strong competition for land and heavy pressure on infrastructure systems in the foreseeable future. The area is in the midst of a transition from what started as suburban/small city context to higher density urban conditions.

The mode choice data for total trips in the study area reflects the density mentioned previously and the relatively high level of transit service. Transit represents 14 percent of total trips, carpools 14 percent and other modes (walking, biking, etc.) 10 percent. The use of these non SOV modes means that parking requirements should be lower than national standards, which are based primarily on suburban area conditions.

Table 1 shows population, density and income data for the four study cities. It shows each of the cities to be of higher than average in density and household income. However, there is significant variation among the cities. West Hollywood has the highest density and Beverly Hills has the highest median household income.

**Table 1. Selected Demographic Characteristics**

	<b>Beverly Hills</b>	<b>Culver City</b>	<b>Santa Monica</b>	<b>West Hollywood</b>
Population (1999)	34,550	41,450	94,200	38,550
Area (square miles)	5.69	4.98	8.14	1.98
Density (population per square mile)	6,072	8,323	11,572	19,470
Median household income (1990)	\$54,348	\$42,971	\$35,997	\$29,314

Sources: California Department of Finance, Thomas Brothers Maps, US Census (1990)

The journey-to-work mode share for the four study cities is shown on Table 2. Because this census-derived data is based on home-based work trips, it shows lower transit and non-SOV share than the data reported in the LACMTA study. This data (lower transit and non-SOV share) reflects the high income characteristics of residents of the Westside Cities. The LACTMA study indicates that 20 percent of journey to work trips are internal to the Mid City-Westside corridor.

**Table 2. Journey to Work Travel Modes**

<b>Travel Mode</b>	<b>Beverly Hills</b>	<b>Culver City</b>	<b>Santa Monica</b>	<b>West Hollywood</b>
Drive Alone	71%	77%	74%	73%
Carpool	8%	11%	8%	9%
Public Transportation	4%	4%	5%	6%
Bicycle	0%	1%	1%	0%
Walked	5%	3%	5%	5%
Worked at home	10%	3%	6%	5%
Other	2%	1%	1%	2%

Source: US Census (1990)

Although this data shows relatively low transit shares, the projected increase in density and population is likely to result in an increase in future transit ridership. Furthermore, projected increases in traffic congestion suggest that it is likely to result in increases in transit use and other alternative modes of transportation.

It is worth noting that data above reflects the responses of people who live in these cities. Their responses may be attributable to the fact that their incomes are higher and many leave these cities to work. Workers coming into the study area may well have lower income levels and higher transit mode shares.

## B. Summary of Parking Requirements, Pricing and Utilization

The study team reviewed parking studies and requirements supplied by the Westside Cities. Each city has developed parking requirements to meet its own needs, goals and objectives. Table 3 summarizes key elements of the requirements. These requirements are fairly consistent with national norms for parking requirements. However, those norms are frequently created for areas that have a lower density than these cities. As mentioned, as the Westside Cities continue their transition to higher density urban places, their parking requirements may evolve to more resemble those applied in the core of major United States cities. This includes a higher emphasis on utilizing demand-based parking requirements that are based on the specific characteristics of each project and city.

**Table 3. Summary of Minimum Parking Requirements  
(spaces per 1,000 gsf, unless specified)**

Land use	Beverly Hills	Culver City	Santa Monica	West Hollywood
Single Family	2 to 4 spaces per dwelling (depends on number of bedrooms)	2 spaces per dwelling (requires additional space(s) above 5 bedrooms)	2 spaces per unit	2 spaces per unit
Multi family Residential	1 space per 0 bedrooms; 2 spaces per 1 bedroom; 2.5 spaces per 2 bedroom; etc.	Ranges from 1.5 spaces per unit to 3.5 spaces per unit	Ranges from 1 space per unit to 2 spaces per unit	Ranges from 1.5 spaces per bedroom to 2 spaces when there are 2 or more bedrooms
Office	1 space per 350 sq.ft. of gfa	1 space per 350 sq. ft.	1 space per 300 sq. ft. of FA	3.5 spaces per 1,000 gfa
Retail	2.85 spaces	1 space per 350 sq.ft.	Ranges from 1 space per 300 sq. ft. of FA. to 1 space per 500 sq. ft. of FA.	3.5 spaces
Restaurant	Ranges from 1 space/45 sq.ft. and 1 space per 350 sq.ft.	Ranges from 1 space per 77 sq.ft. to 263 sq.ft.	Ranges from 1 space per 50 sq. ft. to 1 space per 300 sq. ft.	Ranges from 3.5 spaces to 15 spaces
Mixed uses	Sum of requirements per use	Not specified	Parking can be designated only for disabled and carpooling or vanpooling or residential units	Not specified
Industrial	2 spaces	1 space per 500 gfa.	Ranges from 1 space per 400 sq.ft. to 1 space per 1,000 sq.ft.	2 spaces

Sources: Beverly Hills (1993), Culver City (1992), Santa Monica (1995), West Hollywood (1993), Ranges vary according to conditions

Parking requirements can have the effect of encouraging some types of development and discouraging other types. They can also act as a defacto form of growth control if they limit development or development density (Willson 2000). For example, the Beverly Hills restaurant parking requirement of 1 space per 45 square feet of floor area imposes a very great capital expenditure on any proposal for a new restaurant. Similarly, a parking requirement that may have been economically feasible if parking structures are provided might become infeasible if land limitations dictate providing parking in an underground structure.

By way of comparison, the ITE Parking Generation Handbook provides the following maximum parking utilization rates:

**Table 4: ITE Parking Generation Rates**

Land Use	Peak Demand	Range
Low/Mid Rise Apartment (Saturday)	1.21 spaces per unit	0.68-1.76
Office Building (Weekday)	2.79 spaces per 1,000 sq. ft.	0.75-32.93
Shopping Center (typical Saturday)	3.97 spaces per 1,000 sq. ft.	1.11-6.06
Light Industry	1.55 spaces per 1,000 sq. ft.	0.67-3.48

The appropriate minimum parking requirement depends on more than the average peak demand measured in ITE studies. Minimum requirements must also take into account local conditions (e.g., non-SOV trips), fluctuations in demand (daily, weekly and seasonal), and the likely future occupants of the space. These issues are taken up in greater detail in a subsequent section.

Issues related to compact parking spaces and shared use are very important in circumstances where land use is scarce and parking provision is expensive. Table 5 summarizes the Westside Cities' provision related to compact spaces and shared use parking.

**Table 5. Other Parking Provisions**

<b>Policy</b>	<b>Beverly Hills</b>	<b>Culver City</b>	<b>Santa Monica</b>	<b>West Hollywood</b>
<b>Compact Parking Spaces</b>	<ul style="list-style-type: none"> <li>• Minimum size is 7.5' by 17'</li> <li>• Not allowed to use to meet parking requirements (except for hotels)</li> <li>• Parking in excess of code requirements allows for compact spaces</li> <li>• Beverly Hills parking inventory shows an extremely low incidence of compact spaces</li> </ul>	<p><i>Non-residential</i></p> <ul style="list-style-type: none"> <li>• Maximum of 30% of the first 100 required parking spaces; maximum of 40% of the additional spaces after the initial requirement is met</li> <li>• Any surplus parking spaces may be compact that meets the requirements</li> </ul> <p><i>Residential</i></p> <ul style="list-style-type: none"> <li>• Required parking spaces for residential uses cannot be compact</li> <li>• Codes need to meet Culver City Parking Design and Layout Guidelines</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum is 40% and varies by use</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum size is 7.5' by 15'</li> <li>• For uses with 10 or more required spaces, up to 40% of the required can be used for compact spaces</li> </ul>
<b>Shared Use</b>	<ul style="list-style-type: none"> <li>• Up to 50% of spaces used for daytime can be used for nighttime uses</li> </ul>	<ul style="list-style-type: none"> <li>• Two or more non-residential uses study</li> <li>• Shared spaces are within 750 ft. walking distance</li> <li>• Approved covenant with arrangement and tenant notification</li> <li>• Conduct parking demand study</li> </ul>	<ul style="list-style-type: none"> <li>• Different peak hour parking demand</li> <li>• Sufficient spaces to meet demand</li> <li>• Meet Zoning Administrator requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Different peak hour parking demand of businesses</li> <li>• Maximum walking distance is 400 feet</li> </ul>

Source: Beverly Hills, Culver City, Santa Monica and West Hollywood

The data shown for Beverly Hills private and municipal off-street parking is based on inventory, pricing and utilization data collected in late 1997/early 1998. It indicates an average charge (weighted by number of spaces) for daily parking of \$8.25 in *private* facilities. The corresponding rate for municipal lots and structures was \$1.39 per day. The difference between private and public spaces is quite large. On the surface it suggests that public lots could charge more. However, the private prices are posted prices, which is not always indicative of what most parkers pay. Many employers subsidize employee parking, while commercial and services uses may validate parking. The only way to determine how much parkers pay is to study the subsidy policies of employers and business owners. That type of study is beyond the scope of this effort.

This is important to keep in mind, however, because the observed demand is the level of parking demanded at a price that is significantly lower than the posted price.

The posted average price of \$8.25 per day is high enough such that it could conceivably amortize the cost of providing additional parking. In that respect, the study area is different from the rest of the region in that parking demand is high enough to support parking prices that approach the marginal cost of added spaces.

The data does show significant variation in price, reflecting differences in supply/demand conditions in subareas of the corridor, and different policies for on- and off-street parking facilities.

**Table 6. Ranges of Parking Charges and Typical Charges**

	<b>Beverly Hills</b>	<b>Culver City</b>	<b>Santa Monica</b>	<b>West Hollywood</b>
On-street	\$0.10 to \$1.50 per hour, depending upon location	35 cents per hour	50 cents per hour	N/A
Off-street	Weighted average of 131 structures and lots is \$8.25 per day	N/A	\$6 per hour. In downtown area, parking ranges from \$85 to \$110 per month. In some cases, reserved parking costs as high as \$180 per month	\$3 to \$14 per day; monthly parking ranges from \$30 to \$170
Off-street Municipal	\$0.10 to \$1.50 per hour, depending upon location. Weighted average of \$1.39 per day	N/A	City Hall \$1.10 per 15 min. \$6.60 Daily Max	N/A

Sources: Beverly Hills (1997 and 1998), Santa Monica (1998), West Hollywood (1996)

Two cities provided systematic parking utilization data. Table 7 summarizes the information from a 1997/98 parking utilization survey of over 150 public and private lots conducted in Beverly Hills. Table 8 summarizes parking information from Santa Monica's Downtown Parking Management Program (1998).

**Table 7: Off-Street Parking Utilization in Beverly Hills**

Spaces	Percent Utilization from 10 AM to 12 PM	Percent Utilization from 4 to 6 PM
Private	66%	62%
Municipal	40%	33%
Lots over 85% Utilization Rate*	36%	22%

Source: Beverly Hills (1997 and 1998)

\* - Includes 104 lots with occupancy counts

**Table 8: Downtown Santa Monica Parking Utilization**

	Spaces	Weekday 2 to 3 PM	Weeknight 8 to 9 PM	Saturday evening peak
Public Off-street	3,438	78%	55%	80%
Private Off-street	6,819 (weekday) 5,477 (weeknight) 5,606 (Saturday)	73%	53%	67%
Public On-street	673 (weekday) 739 (weeknight) 739 (Saturday evening peak) 633 metered)	85%	97%	97%
Total	10,257 (weekday)	77%	57%	74%

Source: Kaku Associates (1998)

This data shows that there is a substantial unused inventory of parking in Beverly Hills during the monitoring period. Assuming parking is full at 85% capacity, Santa Monica is experiencing parking shortages in parts of its downtown area. Although the city has policies and programs to minimize the impact of automobiles, it may be necessary to add additional measures to better use parking supply (encourage more changes in travel behavior by employees and customers). The high on-street parking utilization rate suggests that it is underpriced. Increasing meter charges could facilitate higher turnover, and make those spaces more productive, leading to more available spaces.

Still, there is often a significant discrepancy between the hard data of parking counts and perceptions about parking availability. Often the real issue is that **parking is not available at the price that parkers want to pay** or in the location where they want to park. Given the difference in price between municipal lots and private lots, it is easy to see how this perception might emerge. The answer to this issue may not be to build more parking, because unless the parking is highly subsidized, its cost would be as much or more than private facilities. An alternative is to better utilize existing parking resources and to better understand the market price of parking. If the price of parking is considered an impediment to the success of a retail area, for example, then coordinated parking validation systems or increasing cluster (multi-destination) parking may be the answer. Even in Santa Monica's Downtown area, recent recommendations include parking pricing and transportation demand management improvements as well as additional parking supply (Kaku, 1998).

## **C. Existing Policy Framework**

### ***Current Issues***

The consultant team conducted a survey of Southern California jurisdictions in 1995 as part of a parking management outreach program (Kodama, Willson, & Francis 1996). That effort included responses from planners at the four study cities. Table 8 summarizes the main themes that emerged in those telephone interviews. The picture

that emerges from these comments is a large number of issues related to accommodating parking in a higher intensity, largely built out city. They also indicate that parking management strategies for existing on-street and off-street parking are important.

**Table 9. Key Issues Related to Parking**

<b>Beverly Hills</b>	<b>Culver City</b>	<b>Santa Monica</b>	<b>West Hollywood</b>
<ul style="list-style-type: none"> <li>• Avoid impacts to street system</li> <li>• High parking charges</li> <li>• Inadequate parking</li> <li>• Varying parking utilization rates</li> </ul>	<ul style="list-style-type: none"> <li>• Parking demand and supply</li> <li>• Provide sufficient, not excessive parking</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid impact to street system</li> <li>• Impact to local neighborhoods</li> <li>• Issues associated with a built-out city</li> <li>• Undersupply of parking in some areas</li> <li>• National standards often do not apply</li> </ul>	<ul style="list-style-type: none"> <li>• Impacts of land use intensification, e.g., retail to medical</li> <li>• Older buildings not meeting parking requirements</li> <li>• Impact of entertainment events</li> <li>• Trends in space size</li> <li>• Shared parking arrangements</li> </ul>

### ***Current Policy***

The team examined the circulation element and other key documents for each city to determine the current policy framework for implementing parking management strategies. Typically, this policy framework is designed to assure that parking needs are properly addressed and that parking activities are coordinated with local goals and objectives. It includes circulation elements, zoning ordinances, regulations, and building codes. Culver City and Santa Monica have parking codes and policies that encourage demand-based parking.

The following summarizes the policy framework for each city.

### ***Beverly Hills***

The City of Beverly Hills' Circulation Element emphasizes two policies:

1. Preserve and enhance the neighborhoods of Beverly Hills.
2. Vehicles should move into and out of or through Beverly Hills as expeditiously as possible.

According to the Circulation Element, parking should be conveniently located between the access street and commercial destination. The location would intercept the patron and therefore be easily used. There should be accessible parking in adequate quantities. Parking is necessary to support other functions. In-lieu parking may be considered in older multiple-family areas.

Parking policies are provided for the following areas:

#### *Commercial areas*

In the Business Triangle area, parking is analyzed on a district wide basis rather than for each individual use or project within the area. Large and more intensely used facilities are required to provide their own parking. Smaller facilities may be encouraged to provide some or all of their parking in centrally located facilities through an in-lieu or assessment basis.

Guidelines for commercial area parking include:

1. Destination parking should be guided by a clearly visible system.
2. Parking should be uniformly administered with no costs to the consumer.
3. Curbside parking should have a high-turnover rate.
4. Encourage use of off-street parking facilities through valet parking.
5. Seek ways to better utilize parking resources by seeking alternatives for employees.

The circulation element also calls for on-site parking to be provided at minimal or no costs for all-parkers to alleviate spillover parking into the neighborhoods.

#### *Residential Areas*

Some older multiple-family residential areas are unable to accommodate on-site parking. Therefore, it may be appropriate to explore acquiring parcels that become available for centrally located parking for residents and their guests.

#### *Covenant Parking*

Covenant parking may not be used when it is off-site and thus not convenient to the available user. Therefore, it should be designed so that it recognizes factors such as location of the use, type of use, relationship between the use site and parking site and whether or not on-street parking permits would be available to residents in certain areas.

Beverly Hills has implemented a program that encourages sharing parking resources among its businesses. For those businesses interested in locating in or expanding into the area, they can contact the city to request information on where parking may be available for shared use purposes. This programs helps the city and businesses better utilize existing parking resources and enhance economic development. In addition, this program can facilitate shared use arrangements.

### ***Culver City***

The City of Culver City parking code provides for sufficient, but not excessive parking. According to the circulation element of the General Plan (approved July 22, 1996), the objective is to optimize parking availability. Some of the policies supporting this objective include:

1. Examine City parking standards on a regular basis to ensure a balance between sufficiency and restrictiveness, and periodically update the standards to reflect conditions at that time.
2. Reduce pressure on on-street parking through provision of private and public off-street parking facilities.
3. Pursue opportunities to provide clustered parking along commercial corridors
4. Reduce intrusion of spillover parking on residential streets.

Culver City has policies and procedures to reduce neighborhood spillover. This includes a preferential parking program (Culver City, 1990). The program is designed to limit intrusion of non-residential parking into residential neighborhoods. The City initiates proceedings to determine eligibility of a residential neighborhood upon receipt and verification of a petition signed by at least 75% of the households in the proposed area. Upon approval, residents in a preferential parking district may apply for annual and visitor permits.

Culver City allows new development to reduce minimum parking requirements and use demand-based parking requirements through these approaches:

1. Conduct parking demand studies to determine the actual parking needs.
2. Share parking resources within a business district.
3. Allowing projects to share parking resources within the business district. The parking is considered part of a pool of the business district.

### ***Santa Monica***

According to Santa Monica's Circulation Element, the objective for parking is to accommodate project-generated parking (Santa Monica, 1998). It encourages the use of alternative transportation systems management. Some supportive policies include:

1. Encourage the most efficient use of parking facilities.
2. Allow the reduction of parking requirements for new development in accordance with approved transportation control measures which have demonstrated effectiveness in reducing parking needs.
3. Maximize use and efficiency of public parking.
4. Mitigate potential adverse impact of parking intrusion into residential neighborhoods.

The Santa Monica Municipal Code (1995) requires off-street parking to achieve the following:

- Provide parking to meet the needs of varying land uses
- Reduce traffic congestion and hazards
- Protect neighborhoods

The City of Santa Monica can issue a reduced parking permit to allow for the reduction of parking spaces for the following:

- Shared parking
- Senior housing
- Tandem parking
- Low-income housing
- Landmark and Historic Districts.

The City also has a preferential parking program for households. Residents can purchase these permits for household members or for visitors.

Santa Monica used clustered parking in its downtown area to support the Third Street Promenade and to make its downtown a major retail destination. In its continuing effort to improve parking in the city, Santa Monica recently completed a study that recommends parking system improvements to its Downtown area (Kaku, 1998).

### ***West Hollywood***

West Hollywood has parking provisions to regulate parking facility design and equitably establish the number of parking spaces required for various uses. (West Hollywood, 1996). The purpose of having parking requirements is to assure that an adequate number of parking spaces are available to accommodate anticipated demand. The requirements should:

1. Promote vehicular and pedestrian safety
2. Promote efficient land use
3. Promote compatibility between parking facilities and surrounding neighborhoods
4. Protect property values

West Hollywood has established objectives and policies related to parking. This includes protecting residential neighborhoods, establishing a system of parking facilities and operations to serve current and future demand while preserving the quality of life, and to provide parking requirements and public parking facilities that can help West Hollywood overcome commercial and residential parking deficiencies.

West Hollywood has specific policies to reach these objectives. Examples include:

- Traffic calming measures
- Permit parking
- Code requirements for specific uses
- Development of common parking areas for multiple businesses
- Increase public parking supply
- Establish parking assessment districts
- Pursue creation of joint use private parking facilities

Occupancy counts (Walker Parking Consultants, 1992) suggest that there is an adequate supply of parking in West Hollywood, with overall peak capacity of the four busiest commercial areas below 70%. However, the distribution of parking resources and acceptable walking distances results in parking shortages in some commercial areas during peak uses.

West Hollywood has a strong business community that attracts large numbers of employees and visitors. Much of this demand occurs during the evening hours, competing with residential parking areas.

Preferential parking programs existed before the establishment of the city (Spencer Consulting Services, 1996). Currently, preferential parking districts are initiated at the request of residents petitioning the City. It requires a majority (51%) of the residential dwelling units on a street. Then, the City studies parking demand in the area, presents the results at public hearings before the Transportation Commission and City Council, before deciding to approve the boundaries of a district. Households may purchase residential permits, visitor and one-day guest parking permits.

West Hollywood has built new parking structures that incorporate security, signage and design elements into a package that integrate the parking structure into the local community (Gordon, 1997).

### 3. Parking Management Techniques that Support Livable Communities

According to the SCAG Livable Places Initiative, Livable Communities are "a shared community vision of pedestrian friendly, mixed use and transit oriented places scaled to people, not automobiles, and connected to vibrant civic and public spaces." It is about rebuilding "Main Streets" and changing urban design and policies to support people. Many parking management strategies support Livable Community concepts. Parking management can lead to better use of land scaled to people while reducing the level of solo driving and the automobile. Parking strategies can encourage mixed-use, increase land densities and promote a pedestrian-friendly and transit-oriented development.

Parking management strategies can be used alone or in combination with other strategies. Many parking management strategies are complimentary to other livable community tools. However, each parking scenario needs to be looked at on a case by case basis and needs to consider local conditions.

Said the other way, conventional parking requirements can undermine livable communities concepts. For example, requiring excessive parking drives up the cost of development. If parking does not generate revenue, the cost of providing parking can make an otherwise desirable project financially infeasible. Finally, with real limits to roadway expansion, the conventional approach can overload roadway capacity.

The following is a table with descriptions of key parking management techniques that can help manage parking supply and demand more efficiently. Additional information follows the table and includes examples of strategies applicable to the livable community concept such as shared parking, clustered parking, compact parking allowances, valet parking strategies and in-lieu parking fees.

**Table 10. Parking Management Tool Box**

<b>Strategy</b>	<b>Description</b>	<b>Key Conditions</b>	<b>Opportunities</b>	<b>Challenges</b>
Demand-based Parking Requirements	Basing parking requirements on actual community demand levels	<ul style="list-style-type: none"> <li>• Variability in demand</li> <li>• Shared parking strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce capital cost</li> <li>• Reduce land devoted to parking</li> <li>• Pedestrian-friendly design</li> </ul>	<ul style="list-style-type: none"> <li>• Developing strategies to respond to peak demands.</li> </ul>
Shared Use	A parking arrangement that serves two or more land uses	<ul style="list-style-type: none"> <li>• Different peak periods</li> <li>• Compatible land uses</li> <li>• Proximity of the parking</li> <li>• Multi-destination trips (share customers)</li> <li>• Consensus</li> <li>• Pedestrian access</li> <li>• Secure</li> <li>• Clear signage</li> </ul>	<ul style="list-style-type: none"> <li>• Maximize land use</li> <li>• Reduce costs</li> <li>• Enhance economic development</li> </ul>	<ul style="list-style-type: none"> <li>• Incompatible with industrial uses</li> <li>• Similar peak periods</li> <li>• Single destination customers</li> <li>• Pedestrian accessibility</li> <li>• Building consensus</li> <li>• Liability</li> <li>• Maintenance</li> <li>• Security</li> <li>• Signage</li> </ul>
Clustered Parking	Consolidating the parking of two or more land uses into a single facility	<ul style="list-style-type: none"> <li>• Centralized location</li> <li>• Different peak hour uses</li> <li>• Mixed-use facilities</li> <li>• Business district</li> <li>• Pedestrian access</li> <li>• Secure</li> <li>• Clear signage</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce need for surface parking</li> <li>• Maximize land use</li> <li>• Reduce parking capital costs</li> <li>• Increase land use densities</li> <li>• Reduce number of smaller lots</li> <li>• Promote economic development</li> </ul>	<ul style="list-style-type: none"> <li>• Finding centralized location</li> <li>• Similar peak hour uses</li> <li>• Single site</li> <li>• Pedestrian accessibility</li> <li>• Security</li> <li>• Signage</li> <li>• Financing options or resources</li> </ul>

Table 10. Parking Management Tool Box (continued)

Strategy	Description	Key Conditions	Opportunities	Challenges
In-lieu of parking fees	Offer the developer the option of building the required parking or contributing funds to be used in the future	<ul style="list-style-type: none"> <li>• Cost of parking is too high</li> <li>• Development site</li> <li>• Availability of transportation options</li> <li>• Parking can be constructed near project site</li> <li>• High density areas</li> </ul>	<ul style="list-style-type: none"> <li>• Economies of scale</li> <li>• Create funding for alternative modes</li> <li>• Offer flexibility</li> <li>• Creates opportunity for clustered parking</li> <li>• Enhance economic development</li> </ul>	<ul style="list-style-type: none"> <li>• May not increase use of alternative modes</li> <li>• Determining the future value and cost of parking</li> <li>• City may be responsible for debt service and operations</li> <li>• Long-term commuter parking issues</li> <li>• Low density areas</li> </ul>
Parking Charges On-Street	Fees for parking (usually metered)	<ul style="list-style-type: none"> <li>• Demand exceeds parking supply</li> <li>• Higher turnover of prime spaces</li> <li>• Limited supply of off-street parking</li> </ul>	<ul style="list-style-type: none"> <li>• Parking revenues</li> <li>• Increases turnover</li> <li>• Increases access</li> </ul>	<ul style="list-style-type: none"> <li>• Supply exceeds demand</li> <li>• May discourage customers</li> </ul>
Parking Charges Off-street	Fees for parking (Can include employee paid parking)	<ul style="list-style-type: none"> <li>• Demand exceeds supply</li> <li>• Increase turn-over</li> <li>• Limited supply of on-street parking</li> <li>• Precedent for charging</li> <li>• Fees cover operating costs</li> </ul>	<ul style="list-style-type: none"> <li>• Parking revenues</li> <li>• Increases turnover</li> <li>• Increases access</li> </ul>	<ul style="list-style-type: none"> <li>• Supply exceeds demand</li> <li>• May discourage customers</li> </ul>

Table 10. Parking Management Tool Box (continued)

Strategy	Description	Key Conditions	Opportunities	Challenges
Compact Parking Spaces*	<p>Parking that is less in size than standard spaces</p> <p>Typical ranges are 8.5 feet by 18 feet or 9 feet by 22 feet</p>	<ul style="list-style-type: none"> <li>Design allows for maneuverability</li> <li>Large enough to accommodate the 85<sup>th</sup> percentile vehicle</li> <li>Layout allows for pedestrian circulation</li> </ul>	<ul style="list-style-type: none"> <li>Maximize land use</li> <li>Reduce need to build additional parking facilities</li> <li>Increase number of parking spaces</li> <li>Supportive of shared use or clustered parking</li> </ul>	<ul style="list-style-type: none"> <li>Increased size of vehicles</li> <li>High parking turnover types of uses</li> <li>Lack of maneuverability</li> <li>Larger vehicles use more than one space or impact adjacent spaces</li> </ul>
Valet Parking	<p>Service usually provided to patrons of commercial or retail establishments such as hotels, airports, restaurants, retail and special event parking needs</p>	<ul style="list-style-type: none"> <li>Patrons willing to pay for service</li> <li>High parking demand and low parking supply</li> <li>Sufficient area for maneuvering cars and parking stalls</li> <li>Experienced operator</li> </ul>	<ul style="list-style-type: none"> <li>Maximize land use</li> <li>Reduces need for additional parking</li> <li>Increase utilization of parking</li> <li>Better use of parking resources</li> <li>Supports shared use or clustered parking</li> </ul>	<ul style="list-style-type: none"> <li>Lack of a market willing to pay for the service</li> <li>Plentiful and convenient parking</li> <li>Lack of sufficient area to maneuver cars</li> <li>Inexperienced operator</li> </ul>

Sources: Kodama & Williams (1999), Kodama (1996), Kodama (1999), Olympia (1998), Tri-Met, (1996)

\* - Compact Parking Spaces are discussed in detail in Section 5

## **A. Demand-Based Minimum Requirements**

### *Definition*

Conventional minimum parking requirements often require an oversupply of parking (Willson 1995). They treat each land use as an island, assuming that it must provide enough on-site parking to accommodate the highest conceivable demand that may exist. Demand based minimum requirements are based on observed and/or predicted parking demand in a subarea, under the livable community policies that will be implemented, rather than national standards that are usually derived from suburban areas with free parking. Furthermore, they seek innovative accommodation of peak parking demands to avoid requiring all land uses to over-provide parking.

### *Example of Use*

Parking requirements in downtown Los Angeles are one space per 1,000 square feet, lower than ITE parking generation rates and most city requirements. These requirements are lower because downtown Los Angeles has a much higher transit share than any other location in the region. Furthermore, not all employees park on-site. Many take advantage of a large pool of private parking lots, trading off parking price with walking distance. Downtown San Francisco has even more restrictive parking policies for new development.

### *Key Issues*

- Understanding trends in parking demand, e.g., types of tenants, employee density, existence of other parking facilities to accommodate overflow.
- Controlling potential spillover demand in residential areas.
- Organization strategies for accommodating peak parking demand (e.g., off-site retail employee parking during the holiday shopping season).

## **B. Shared Parking**

### *Definition*

A parking arrangement where spaces serve two or more land uses. This arrangement allows for two or more businesses to share the same parking facility. Generally, shared parking is effective in areas with businesses that have different peak hour parking demands and are located within close proximity to each other (Williams, 1999; Stein Engineering, May 1997).

### *Example of Use*

Ashland, Oregon wanted to address a seasonal parking shortage in its downtown area that occurred during an annual festival. The city conducted an inventory and study of parking needs. The study looked at potential shared parking areas. This study

identified 3 parcels that could be developed into parking facilities. A local improvement district was developed to fund the development of parking. A fee is charged to business owners through their utility bills.

The City of South Pasadena (1999) encourages shared use parking arrangements. Efforts to utilize shared use opportunities include:

- The South Pasadena School District allowed a business to use its parking lot at Fairview and Mission.
- A cooking school provided its parking lot to a local church for its Sunday services.
- A church leases some of its parking during weekdays to an adjacent office building.
- A local bank worked with the City of South Pasadena to allow use of the bank parking lot for Rose Bowl float activities.

#### *Key issues*

- Different types of land uses and peak hours
- Land uses that share the same customers
- Pedestrian distance from the land use to the parking
- Pedestrian access should be easily defined and secure
- Signage that clearly directs and parking information such as maps
- Creating a clear agreement regarding maintenance, lighting, litter and liability issues
- Monitoring shared parking arrangement so that an increase in parking demand is taken into consideration and the facility is not used to generate revenue

### **C. Clustered Parking**

#### *Definition*

Clustering or consolidating the parking for two or more land uses into a single facility. One of the objectives is to consolidate different land uses and thereby reduce the need to build excess parking. It can result in a better utilization of parking resources in a project area and reduce the need for smaller parking lots in different locations. This technique can help promote economic development, increase densities and promote mixed-use. In some cases, it can free land for other uses.

Clustered parking can be built around "Main Streets," thereby creating a more livable community with pedestrian linkages between parking structures and destinations. This leads to better urban form and a more walkable environment. Clustered parking is used in Beverly Hills, Culver City, Santa Monica and West Hollywood.

### *Example of Use*

The City of Burbank (1992) built parking structures to serve the needs of its downtown parking district. This helped to make better use of parking resources in a downtown with restaurants and movie theaters. By looking at the downtown area parking as a whole and not stand-alone properties, the city developed parking to meet "multiple destination parking" needs. As a result, they were able to cluster parking.

The City of Portland clusters many uses and allows for more development on a single site (Williams, 2000). This can help to encourage higher densities and mixed-use development. Portland has used clustering to reduce the overall parking supply in a sub-area. This approach can help reduce the costs of parking and maximize land use.

### *Key issues*

- Complimentary peak hour uses (Clustering works best with land uses that have complimentary uses such as a restaurant and movie theatre).
- Creating a livable community environment that encourages walking and use of alternative modes.
- Working with key stakeholders to view parking on a collective, district-wide basis that can benefit everyone in the area.

## **D. Valet Parking**

### *Definition*

Valet parking is usually provided as a service to patrons of commercial establishments. This service helps patrons of businesses with parking that may be inconvenient, inaccessible or unavailable. Usually, the cars are taken by the valet at the entrance of an establishment such as a restaurant, hotel or entertainment facility. The valet parks the vehicle at another location and brings the vehicle back to the entrance when the patron or customer is ready to leave. It is a parking service that offers convenience and accessibility at a cost.

### *Example of Use*

The City of Manhattan Beach did not have enough short-term parking spaces, especially during the after hours and on the weekends. The available parking was not sufficient enough to support the restaurants and merchants in the downtown business area. However, the city did not have the needed resources or land to build a parking structure. The city worked with the Downtown Business District to create a parking management program that utilized valet parking to create more short-term parking. A valet parking company was hired to implement the project. The company was able to identify and utilize 220 unused spaces. The valet is open Thursday and Friday after 6:00 p.m. and all day during the weekends. 10 spaces are used for the valet stands where cars are dropped off or picked-up. According to an article in *Parking Today* (1999), the program has successfully increased the parking supply by 210 spaces.

**Table 11. Parking Utilization after Implementation of Valet Parking Program**

<b>Parking Supply and Demand</b>	<b>Spaces/Vehicles</b>
Increase in Parking Supply	220 Spaces
Peak Hour Parking Utilization	210 Vehicles *
Turn over	3 times per day

Source: Parking Today (1999)

\* - 10 spaces are used for the valet stand

**Table 12. Valet Parking Prices**

<b>Time</b>	<b>Amount</b>
First Two Hours	\$ 2.50
20 Minutes (after first two hours)	\$1.00
Maximum	\$12.50

Source: Parking Today (1999)

The City of Pasadena also implemented a valet parking program (Johnson, 2000). Unlike many cities, Pasadena has an ordinance that regulates valet parking in the historic 20-block Old Pasadena area. Restaurants are the most common business that use valet parking. One operation is allowed per block. As a result, one operator might serve four restaurants. Parking demand for prime spaces is high and restaurant customers are willing to pay for valet parking services.

*Key issues*

- Cost of labor to provide valet parking service
- Experience of parking attendants to successfully park cars
- High parking demand and low parking supply
- Sufficient area for maneuvering cars and parking stalls
- Usually, applies to hotel, airport, restaurant, shopper, and special event parking where a high level of service is needed
- Potential spillover to other areas

## **E. In-lieu parking fees**

### *Definition*

In-lieu parking fees provide the developer with an option to build the required number of parking spaces or contribute fees to a fund. Generally, these fees may be used at a future date for off-street parking facilities. These fees are calculated on the basis of the cost of parking or a portion thereof. In some cases, the fees may be used to fund programs that promote alternative modes of transportation. In-lieu fees provide opportunities to cluster parking, to build parking more efficiently, and to facilitate development in locations with difficult parcel configurations. Fees can be calculated on a case-by-case or on a fee per space basis (Shoup, 1999; Smith, 1983, Urban Land Institute 1993; Weant & Levinson 1990).

In-lieu parking fees as a strategy presents a number of challenges. There are certain key conditions that must be in place before even considering in-lieu of parking fees. When considering this strategy, an entity will need to carefully examine a number of factors, which are listed below under the key issue section.

### *Example of Use*

The use of in-lieu parking fees can vary with the municipality. Some cities have used the funds to finance central parking garages to be available for the area as well as the development that provided the fees. Other cities have used the fees to pay for future parking needs or to provide funding for alternative modes or services that reduce parking demand.

Montgomery, Maryland allows for a reduction in parking and payment into a fund for ridesharing. A parking study indicated that those areas where transit etc, was available the parking demand was lower. As a result, a developer may be able to reduce up to 15% of their parking requirements, if they make an annual contribution to the Ridesharing Fund for basic or supplementary Share-A-Ride services. This is up to 40 cents/\$100 of the assessed value.

Beverly Hills, Culver City and West Hollywood have in-lieu fee programs. The City of Beverly Hills has an in-lieu fee program. Funds are used exclusively for the purpose of acquiring, developing, operating and maintaining off-street parking facilities to serve the In-Lieu Parking District (Beverly Hills Municipal Code). Culver City's In-lieu fee program allows the payment of fees in lieu of providing required parking. The fee is calculated at five times the current County-assessed value for the land at three hundred square feet per required parking space that is missing (Culver City Code). The City of West Hollywood's In-Lieu Fee program requires project approval by the Planning Commission and contributions to the City's Parking Improvement Trust Fund (West Hollywood Municipal Code).

### *Key issues*

- Impact of inflation on parking costs (Parking can be very expensive to construct and costs may increase over time).
- Timeliness of the use of the funds (Slow development patterns can create a condition where funds are contributed at an uneven pace. An area with accelerated development might be a more likely candidate).
- Potential lack of use of funds for developer.
- Future construction of parking not in close proximity to the development.
- Ensuring that the funds collected are enough for construction.
- Creating a methodology to determine the amount of funds needed and determining a market value for parking.
- Density of the area.

## **F. Parking Pricing**

Parking is not free. It costs money to build parking lots or parking structures. A parking space can cost from \$1,200 to \$20,000; if you add in land and operation costs it can be even higher. For example, according to Don Shoup (1999), the average cost of parking structures built at UCLA since 1977 is \$23,600 per space (1994 dollars). In the same study, a Palo Alto municipal parking structure space costs \$17,848, a Walnut Creek municipal parking structure space cost \$32,400 and a parking space in a Beverly Hills municipal parking structure (including land and construction costs) is \$37,000.

Most people do not consider the economic impact of parking. With the exception of higher density commercial districts and special event destinations, most people are not accustomed to parking charges.

However, in Westside Cities, parking pricing occurs in some public and private parking areas. This includes parking pricing on-street and off-street.

While free off-street parking is available in all four cities, many lots have monthly, daily or hourly parking rates. For example, according to data provided by the City of Beverly Hills on 164 parking lots:

- Thirty five parking lots charge \$50 to \$200 per month
- Eighty four parking lots charge \$5 to \$15 per day
- Eighty five parking lots charge \$1 to \$15 per hour

In Santa Monica, monthly parking rates in the Downtown area range from \$85 to \$110 per month. In some cases, reserved parking costs as high as \$180 per month (Kaku, 1998).

The following are examples of parking pricing scenarios and issues related to retail and early bird, afternoon and evening parking rates.

### *Retail*

Retail businesses are interested in selling their own products. Parking becomes an issue when their employees or customers cannot find it or it becomes too expensive. Parking becomes an issue when it impacts the company's profit margin.

The purpose of retail parking is to provide parking spaces that maximize the economic vitality of the business. Parking spaces can be designed for use by customers and employees. In many retail areas, the first questions to ask are: 1) where are the employees parking? 2) Do they have viable commute options? 3) Can we free up more prime parking spaces for customers?

Even if there is no price for a parking space ("free parking"), there is a value to the space (for customers, employees or visitors). In many retail areas with demand greater than supply, there is often a need to maximize customer parking and move employees to less desirable parking spaces or to alternative modes of transportation. To help people better understand the cost of parking, a parking space can be translated to 8 to 10 sales per day. Another study estimated that each retail metered space is worth \$5 to \$85 per day.

Perhaps the simplest way to look at parking spaces is to think of the value of 100 parking spaces and compare the use of parking by either customers or commuters (employees).

**Table 13. Customer Parking Example**

Parking spaces	Trips	Comments
100 short-term customer spaces	400 trips (4 customers per space)	<b>Additional 285 trips. 400 customer trips.</b>
100 commuter spaces	115 trips (1.15 commuters per space)	115 trips. <b>No customers.</b>

Source: Rick Williams, 2000

Some cities utilize parking pricing to increase customer parking in retail areas. For example, the City of Olympia provides long-term parking in less desirable parking lots and uses time restrictions on-street to free up parking spaces for customers in front of retail stores.

### *Early Bird, Afternoon and Evening Parking Rates*

Other parking pricing strategies can have an impact on either supporting or discouraging Livable Communities concepts. The early bird parking rates typically are offered in morning hours before 9:00 am or 10:00 am. Parking operators as well as building owners implement the early bird programs in order to guarantee daily income and reduce labor costs. Early bird parking may not be supportive of Livable Community concepts because the early bird rates discount parking prices and thereby encourage solo drivers during the morning peak hour commute.

Afternoon rates are usually set at half-hour to one-hour time periods. Typically, these rates are less than the Daily Maximum yet affordable for the visitor (short-term parking) and at the same time more expensive for an employee (long-term parking).

Generally, evening and weekend rates (in particular for office) are lower than the weekly rates. This is primarily because the workforce is not there during those time periods. Usually, after 6:00 p.m. and on the weekends a flat parking rate will be charged. Sometimes, if the lot is unfilled, parking may be discounted during the evening hours for special events.

#### 4. Analysis of Parking Needs for Residential, Office, Retail and Industrial

The study team looked for existing data that would permit calculations of existing parking demand levels. Beverly Hills has a comprehensive study of parking utilization, which has been reported on early. Culver City requires parking demand studies for each major project. No systematic study data source, however, links parking utilization to occupied building area to permit the establishment of parking demand levels per square foot of building area.

Since the study effort did not include resources for such surveys, this section examines the question of parking need by using national parking utilization data, making adjustments for local conditions. It examines parking requirements for multi-family housing, office uses, shopping centers and light industrial.

Table 14 shows how conventional parking requirements are created based on parking utilization data. The table uses Institute of Transportation Engineers parking utilization data, which is a compilation of actual parking utilization studies performed across the country. The data primarily reflects parking conditions at free standing developments where little transit service is available.

**Table 14. Parking Requirement Calculations**

	Multi-Family Housing (per dwelling unit; Saturday)	Office (per 1,000 sq. ft. building area)	Shopping Center (per 1,000 sq. ft. building area; Saturday)	Light Industrial (per 1,000 sq. ft. building area)
ITE Average Demand	1.21	2.79	3.97	1.55
85th percentile Demand (Avg. + 1 St. Dev.)	1.52	3.0	5.0	2.43
Design Value (w/ 10% vacancy factor)	N/A	3.3	5.5	2.67
Westside mode choice adjustment (15%)	1.29	2.8	4.67	2.27

Sources: ITE Parking Generation Handbook (1987), Weant and Levison (1990) Parking, Eno Foundation. pp. 123; Estimates

Most parking requirements are not based on the average demand for parking (Kodama, Willson & Francis, 1996). Conventional practice in parking requirements is to increase rates from the *average* demand to an 85 percentile demand, which represent conditions on the 85 percentile busiest day. This has the effect of reducing parking shortages in

projects that have higher than average demand, but it means that many projects are required to build more parking than they need. Furthermore, it is common to add a 10 or 15 percent margin to allow for special peak demands and ease the process of finding a space. Finding the last available space in a parking facility requires extra circulation when a parking structure is almost full. Each of these factors is used to adjust the average demand to a parking requirement. Those rates shown as "Design Value" on Table 14 are in the range of the values found in most zoning ordinances.

Basing parking requirements on ITE rates can be inaccurate if local conditions are different from national averages. In particular, more urbanized areas have higher levels of transit and walking trips. The standard rates must be adjusted to take into account the levels of transit use, non-motorized travel and carpooling in a specific area. In this case a 15 percent reduction in parking demand applied, based on the higher levels of transit and non-automobile commuting described earlier in the report.

These rates are in the range of the current rates in the four study cities. Local requirements may, of course, reflect local conditions that are not represented in these generic calculations. The key policy question is how these rates might be changed to reflect the implementation of livable communities concepts in the study area?

#### **A. Impact of Parking Requirements on Livable Communities**

Livable communities concepts hold the promise of reducing the need for parking by increasing walking and transit trips and possibly lowering automobile ownership. Any reductions in parking can have major savings for the development, especially in the high land cost context of the Westside Cities. They could make the difference on whether an affordable housing project is financially feasible. Their impact on commercial rents can make the difference as to whether a start-up firm can locate in the study area cities.

There is a growing body of evidence about how new approaches to parking can change land use and transportation outcomes. The list of references at the end of this report provides some of the literature in this area. To summarize very briefly, studies have found that mode choice is responsive to parking price. Free parking encourages solo driving. Studies of parking requirements and parking utilization have found that in many cases workplace parking is oversupplied, which lowers density and hurts prospects for livable communities. For local planners, however, attention is often focused on those instances where there is not enough parking, and where that condition affects neighborhoods, commercial districts and the like. There is generally no local constituency that is concerned about the oversupply or underpricing of parking, which makes this a leadership issue for planners and local decision makers. Fortunately, there are a host of doable parking management strategies that are available to manage parking impacts.

To understand the impact of new parking concepts on parking requirements would require a comprehensive review of land use, economic development, urban design and transportation facilities changes. This section provides an adjustment process for considering those changes on a site specific or subarea basis.

The first set of issues relates to the adjustment procedures normally applied to ITE average parking levels. These adjustments are not fixed rules, but questions of policy. For example, a city could decide to base requirements on average demand, not 85<sup>th</sup> percentile demand. This would mean that there would be some cases where demand exceeded supply, but there are many parking management strategies available to deal with these issues. For example, a shared parking strategy could provide extra parking for a shopping center during their peak shopping period. On-street parking resources could be used (with proper pricing and management) to supplement off-street parking facilities.

Similarly, the practice of adding 10 or 15 percent capacity to allow for ease in finding spaces is also a matter of policy. In a high density area like Westside Cities, people are more accustomed to searching for a parking space. Their expectations are not the same as a shopper at a suburban mall. The issues of avoiding difficulty in finding a space may be addressed by Intelligent Transportation Systems (ITS) that provide real-time information on space availability to parkers, thereby reducing the need for an extra cushion of supply. In some European cities, sophisticated ITS systems link traffic control on streets and real time parking occupancy information to guide shoppers to available spaces.

Finally, the mode adjustment could be made more precise by examining mode access in a more site specific fashion, looking at transit service corridors, transit and pedestrian use patterns for specific areas, and the internal trip production within mixed use developments.

The development of new livable communities strategies can further reduce the need for parking. They can affect mode choice, the level of parking turnover, patterns of demand peaks and achieve better use of existing parking resources. Tables 15 through 18 provide parking management strategies calculation toolboxes for each of the four types of parking requirements that are studied. They are used to illustrate how parking management strategies might be used to affect the amount of parking required.

Table 15. Multi-Family Housing Parking Management Calculation Toolbox

	Range of Adjustment Factors	Example Adjustment	Parking Requirement (spaces per unit)	Measures that could produce result
Base Rate			1.4	
Auto Ownership Adjustment	5-25 percent	5 percent	-0.1	Unbundle the cost of parking charges, affordable housing strategies.
Shared Visitor Parking	5-10 percent	5 percent	-0.1	Shared or clustered visitor parking can reduce the need for individual developments to provide enough for peak uses.
Adjusted Rate			1.2	

Table 16. Office Parking Management Calculation Toolbox

	Range of Adjustment Factors	Example Adjustment	Parking Requirement (spaces per 1,000 sq. ft.)	Measures that could produce result
Base Rate			2.8	
Mode choice adjustment	5-25 percent	10 percent	-0.3	Rideshare incentives, parking cash-out, parking charges
Off-site overflow parking	5-15 percent	10 percent	-0.3	Provide for average demand, not 85 <sup>th</sup> percentile demand; off-site within walking of shuttle distance
Shared Visitor Parking	5-10 percent	5 percent	-0.1	Shared or clustered visitor parking can reduce the need for individual developments to provide enough for peak uses.
Adjusted Rate			2.1	

Table 17. Shopping Center Parking Management Calculation Toolbox

	Range of Adjustment Factors	Example Adjustment	Parking Requirement (spaces per 1,000 sq. ft.)	Measures that could produce result
Base Rate			4.7	
Mode choice adjustment	5-25 percent	10 percent	-0.5	Rideshare incentives, parking cash-out, parking charges
Off-site employee parking	5-15 percent	10 percent	-0.5	Off-site parking with shuttle and/or walking connection
Off-site shopper parking in peak period	5-30 percent	15 percent	-0.7	Overflow parking with shuttle and/or walking connection.
High turnover retail uses	5-50 percent	5 percent	-0.2	Development agreement could require parking-efficient types of retail uses
Valet/ stacked parking	5-20 percent	10 percent	-0.5	Institute valet program
Adjusted Rate			2.3	

Table 18. Light Industrial Parking Management Calculation Toolbox

	Range of Adjustment Factors	Example Adjustment	Parking Requirement (spaces per 1,000 sq. ft.)	Measures that could produce result
Base Rate			2.8	
Mode choice adjustment	5-25 percent	10 percent	-0.3	Rideshare incentives, parking cash-out, parking charges
Off-site overflow parking	5-15 percent	10 percent	-0.3	Provide for average demand, not 85 <sup>th</sup> percentile demand; off-site within walking of shuttle distance
Adjusted Rate			2.2	

## B. Shared Parking

The discussion of appropriate demand-based parking requirements must be combined with considerations of shared parking. Shared parking is the single most effective way of gaining more efficient use of a given parking supply. It requires coordination between property owners and/or tenants, urban design features that enhance the connection between projects, and effective parking management and controls. The particulars of shared parking depend on the peak demands of each use being considered, and therefore cannot be expressed as a percentage guideline. Table 19 provides a simple illustration of the effects of shared parking, using conventional assumptions about parking demand. It shows that shared parking could reduce the number of spaces provided by 60 spaces in the scenario presented. Much larger reductions in total parking required are possible if the uses have less overlap in demand.

**Table 19: Illustration of Shared Parking Potential**

<b>Assume 200,000 sq. ft. office and 60,000 sq. ft retail</b>				
Determine parking demand rates by time period:				
	Weekday		Weekend	
	Day	Night	Day	Night
Retail	4.0	4.4	5.0	3.4
Office	3.0	0.0	0.5	0.0
Apply rates to square footage:				
	Weekday		Weekend	
	Day	Night	Day	Night
Retail	240	256	300	204
Office	600	0	100	0
Parking Needed	840	256	400	204
Parking required if shared parking: <b>840 spaces</b>				
Parking required if no shared parking: <b>900 spaces</b>				

Livable communities land use, transportation and parking strategies can create a synergy that reduces automobile dependency. The methods used here provide examples of how adjustments might be made. However, implementation of revised parking requirements requires detailed study of parking conditions in a subarea of the city, testing of the adjustment factors for those particular circumstances, and identification of implementation programs that will carry out those strategies.

## 5. Parking Space Size and Design Regulations

This section describes guidelines and issues related to compact parking space size and design regulations. Standard sizes vary, but they can range from 8.5 feet by 18 feet to 9 feet by 22 feet. Compact parking spaces can range from 7.5 feet by 15 feet to 8 by 18 feet. In some areas, the number of compact parking spaces allowed can vary from 20 percent to 50 percent.

Parking space regulations, especially those that address parking space size have undergone changes over the past few decades. During the energy crisis of the 70's, smaller vehicles became more prevalent. When it appeared automobile size was on a downward trend some cities reduced minimum size and many introduced compact space programs. The market share of smaller vehicles hit a plateau from 1980 to 1990 and has declined since that time. In the past decade, the new trend has been a greater share of larger vehicles such as vans and sport utility vehicles (Taub, 1999; Gordon, 1997). Compact space programs, while common, have encountered many issues that have made the design much less useful. Some of these issues are listed in the table below.

**Table 20. Pros and Cons of Compact Parking Spaces**

Pros	Cons
<ul style="list-style-type: none"><li>• Maximize land use by consolidating more parking spaces on single or fewer sites</li><li>• Reduce costs of building parking (lowers costs per stall)</li><li>• Regular parker is more familiar with the parking design</li></ul>	<ul style="list-style-type: none"><li>• Not customer or visitor friendly.</li><li>• Does not work well in high turnover areas</li><li>• Lack of maneuverability and restricted turning radius</li><li>• Difficult to enforce</li><li>• Increase in use of larger vehicles that may exceed the standard space and park in more than one space</li><li>• Increase in damage to vehicles</li><li>• Drivers may take prime spaces regardless of the size</li><li>• Determining the appropriate mix of standard and compact spaces</li></ul>

Source: Williams (2000);

A frequent or monthly parker who is familiar with a parking facility with compact parking spaces may be more likely to maneuver properly. This is not the case of an infrequent customer or visitor who is less likely to be able to maneuver into and out of the compact parking space. Also, land uses involving high turnover of parking spaces can lead to a lack of maneuverability resulting in damage to cars. Using a typical 24 foot aisle, it is difficult for the driver to turn into a compact parking space, particularly with stalls that are set at 90 degrees (Williams, 2000).

With the advent of larger vehicles, a common issue is enforceability. In many situations, there is insufficient staff or budget available to enforce compact parking space

requirements at all locations. Owners of larger vehicles may use more than one stall to park or may try to park in a compact space. As of the writing of this report, there is no cessation of the trend toward larger vehicles.

One of the current trends among parking design firms is to develop parking stalls that are of standard size without any compact parking spaces. Some of the reasons include: the difficulty in enforcement, larger vehicles using more than one compact space, lack of maneuverability and potential damage to vehicles. (Francis, 2000)

While there is not consensus on a universal size, the 9 foot stall is frequently mentioned. In Portland, an 8.6 stall size is used because it can accommodate larger vehicles such as Sports Utility Vehicles (SUVs). However, some developers and others consider the 8.6 stall size too restrictive. There are many issues to examine related to compact parking spaces. For example, determining whether compact spaces can be placed in a parking facility, depends upon the spacing and the number of columns, the geometry of the area and size of the aisles. Narrow aisles make it more difficult to maneuver. In addition, the type of land use is important to consider.

Compact parking space design has been considered in some areas as a tool to promote livable communities. The key objectives of using compact parking space design in this context are to maximize the land use and promote a pedestrian-friendly and transit supportive environment. However, typically, compact parking design has been used to meet parking requirements and reduce construction costs. Although compact parking space design may help support livable communities, there are many issues associated with this design. Cities will need to consider these strategies on a case by case basis as well as the potential downside. Additional studies should be considered on a project by project basis.

The City of Portland has compact parking space requirements that set minimum and maximum standards. The minimum standard requires that 60 percent of the number of parking spaces must be standard stalls. A maximum of 40 percent of the spaces is allowed for compact parking.

**Table 21. Ranges of Parking Space Sizes in Communities**

<b>Jurisdiction</b>	<b>Space size regulations (90 degree parking)</b>
General guideline	Standard size: 8.5' wide, 18' long Modified standard space: 8' wide, 17.5' long Small-car space: 7.5' wide
General guideline	8.25 width with 60.8' module (two spaces plus lane) for a 30% small car, 70% large car mix operating at LOS C. (Parking LOS is analogous to traffic levels and permits flexibility in parking design)
Portland, Oregon	Standard size: varies according to angles, ranges from 8' to 9' width and up to 22' Compact size: varies according to angles from 7.6' to 15' 60% of required parking spaces standard size and up to 40% can be compact parking spaces
San Francisco	Standard size: minimum 160 square feet per space Small car space: 127.5 square feet per space, up to 50% of all spaces

Sources: City of Gresham (1999); Weant and Levinson (1990); Chrest, Smith and Bhuyan (1996), Williams (2000), City of Portland, 2000

### ***Considerations for City Policies***

Policies related to compact parking design will vary according to each city's circumstances and objectives and according to specific land uses. Cities will need to assess their own communities to reach that determination. Additional studies are recommended on this complex area of parking management as policies are examined.

As mentioned earlier, typically, compact parking spaces are used to meet parking code requirements and reduce parking costs. There are no clear examples where they have been successfully used to support Livable Community concepts. A city may want to be aware of these issues as well. In addition, some cities may want to consider issues related to the change in size of vehicles and potential damage that occurs to vehicles.

Cities with compact parking design issues may also consider exploring the following:

- Providing signage designating compact parking stalls for the visitor or customer.
- Avoiding the use of compact parking spaces in high turnover areas.
- Adjusting requirements to match the type of land use.
- Locating compact parking away from prime spaces to less used areas of the facility.
- Ensuring that an adequate percentage of spaces are standard size. The percentage could range from 60 percent or to 100 percent of the total required parking spaces.
- Studies should be encouraged because the geometry and terrain conditions vary.
- Determining the feasibility of enforcement of compact spaces.

## **6. Implementation: Developing Parking Management Programs**

The implementation process for parking management strategies that can support livable communities can vary. This section contains: 1) a preliminary feasibility checklist for parking management strategies, 2) an example of the process of when and where parking management strategies might be considered and 3) relevant case studies of implemented parking management programs.

### **A. Preliminary Feasibility Checklist for Developing Livable Community Parking Management Strategies**

The checklist on the following page is intended to assist cities at the beginning of the process to assess the potential for implementing parking management strategies.

**Table 22. Preliminary Feasibility Checklist for Developing Livable Community Parking Management Strategies**

<input checked="" type="checkbox"/> Check the appropriate box.	Yes	Probably	Maybe	Probably Not	No
<input checked="" type="checkbox"/> Does the area have a pool of excess parking that could be more efficiently used?					
<input checked="" type="checkbox"/> Does the area support viable alternative modes of transportation?					
<input checked="" type="checkbox"/> Will the strategies support mixed uses?					
<input checked="" type="checkbox"/> Will the strategies support transit oriented development?					
<input checked="" type="checkbox"/> Is there demand for development that could use unused parking spaces as development sites?					
<input checked="" type="checkbox"/> Are there pedestrian and urban design linkages connecting parking lots with destinations in the project area?					
<input checked="" type="checkbox"/> Does the physical layout of the project area enable shared parking between sites?					
<input checked="" type="checkbox"/> Are the costs of providing parking limiting the development potential of the project area?					
<input checked="" type="checkbox"/> Are there mechanisms to address neighborhood spillover parking?					
<input checked="" type="checkbox"/> Does the diversity of land uses and peak parking periods support shared parking?					
<input checked="" type="checkbox"/> Do the strategies enhance streetscape aesthetics?					
<input checked="" type="checkbox"/> Do the strategies encourage economic vitality?					
<input checked="" type="checkbox"/> Do the strategies improve access to the project area?					
<input checked="" type="checkbox"/> Will the strategies encourage better use of parking resources?					
<input checked="" type="checkbox"/> Is there paid parking in the area?					
<input checked="" type="checkbox"/> Will strategies result in reduction of localized congestion?					

Comments:

Described below is an example of the implementation process needed to develop a parking management program designed to support livable community concepts. The process described consists of guidelines and is generic. The exact steps and process will vary with each city. Parking management strategies can be implemented as part of the development process or as a tenant-based program. The following describes this process.

Involving key stakeholders is an important part of developing parking management techniques that can support livable communities. A key step is identifying key stakeholders and increasing awareness of livable community concepts through an educational process. Key Stakeholders can be defined as those individuals who have a vested interest in parking management programs that might affect them. These may include local government, businesses, neighborhoods and associations.

## B. Implementation Process

Parking management strategies can be integrated into a city's development and design guidelines. The program can become part of the City's policy (general plan, guidelines and resolutions), economic development (applicable strategies), and planning (code) functions. The intent is to incorporate parking management strategies into the project approval process and use these strategies through the city's building permit process. Use of development-based parking management strategies will require enforcement mechanisms, evaluation methodology and city approval processes that are designed for the specific goals and objectives of each city. The city can require parking management strategies at certain points in the process.

Cities use a variety of development methodologies. When a city is doing a redevelopment project in a large area, it will solicit proposals.

The following is an example of how parking management can be included in a typical development project:

**Table 23. Example of Parking Management Development Process**

<b>Economic Development</b>	<b>Planning</b>	<b>City Council</b>
Parking management is used as a tool to support livable community concepts. City staff and developer look at feasibility of parking management strategy or strategies applicable to a project.	City staff use parking management guidelines and parking code to enforce appropriate parking management policies and procedures.	City council approves parking management as part of the project. City can also approve applicable strategies as part of the planning code or as a resolution.

## Parking Management as part of the Application Process for a Development Project

This methodology is designed to introduce parking management into the planning and economic development process. The following is an example of how parking management can be integrated into a project:

**Table 24. Example of Implementation Process for Parking Management Strategies**

Application Process	Parking Management
1. Developer submits proposal to City	Developer has conducted analysis that includes general plan, codes, parking utilization, requirements and potential parking management strategies.
2. City considers proposal	City examines parking issue. This includes supply, demand, requirements and potential impact of one or more of the following: shared use, clustered parking, parking pricing, compact spaces and valet parking strategies.
3. Appraise land, structures, equipment, and relocation costs	City and developer look at costs of parking and applicable strategies.
4. City approves report and conducts public hearing with detailed costs of acquisition	City includes costs of parking and parking management strategies.
5. City approves environmental document	City looks at potential environmental impact of parking and parking management.
6. City approves development agreement	City approves parking and parking management strategies.
7. Applicant obtains and submits application	Applicant reviews codes and parking management resolution and guidelines.
8. Planning staff reviews application and schedules public hearings	Planning staff reviews parking management resolution and guidelines.
9. Boards and commissions review reports and issue recommendations	
10. City council issues decision	Parking management plan is approved.

### C. Case Studies

Cities and other governmental agencies have utilized parking management strategies to encourage the use of Livable Communities concepts. Listed below are examples of some approaches.

#### *Portland Metro Area, Oregon*

The City of Portland has utilized land use and demand based parking management strategies to promote Livable Communities concepts. The city has done this through strategies that help to better manage parking supply and encourage growth within an urban growth boundary area.

Under the State of Oregon's Transportation Planning Rule (TPR), the Portland Metro area is required to reduce the number of non-residential parking spaces by 10 percent per person by 2015.

Local jurisdictions within the Urban Growth Boundaries are starting to implement the regional parking standards. Many of the cities are looking at creative demand and supply strategies to help businesses and communities meet the regional planning objectives. For example, the City of Gresham is looking into extensive use of shared parking to meet parking requirements while facilitating retail development. This includes a plan to combine retail, office and government functions with a new multiplex theatre.

Employers covered under the Employee Commute Options Program may be affected when they are expanding a worksite, or relocating within the Portland Air Quality Maintenance Area. Their building may or may not meet the requirements of the Voluntary Maximum Parking Ratio Program. This program has created a standard for maximum parking limits of various buildings.

#### *Parking Goals and Issues*

- Meet the requirements of the State of Oregon's Transportation Planning Rule.
- Encourage use of alternative modes of transportation and parking management strategies.
- Reduce oversupply of parking spaces.
- Manage parking more efficiently.

#### *Parking Management Strategies*

- Minimum and Maximum Zoning Requirements
- Parking Caps
- Area-wide parking Caps
- Shared Parking
- Preferential Carpool Parking

Citizens, community groups, Metro and local government agencies created the parking management program after several years of participation. Metro and local government provided the analysis to help shape parking management policies. Metro is the regional government that serves residents in Clackamas, Multnomah and Washington counties and the 24 cities in the Portland metropolitan area.

Studies were taken to determine if certain parking requirements and strategies were appropriate. These included utilization studies and surveys of key stakeholders.

#### *Key Strategies*

In 1995, the Oregon Department of Environmental Quality (DEQ) conducted a study to determine how much parking was being utilized. The study was used to establish baseline data for a Minimum Parking and Maximum Parking Requirements program.

According to the DEQ, 90 suburban locations around the metro region were studied to supplement data on 13 land uses not covered in Institute of Transportation Engineers parking demand manuals. Some of the findings are listed below:

**Table 25. State DEQ Oregon Parking Utilization Study**

<b>Type of Use and Average Demand</b>	<b>Average Supply</b>
Office-3.0/1,000	3.4/1,000
Discount store-3.1/1,000	5.0/1,000
Fast Food (with/drive through) 10.0/1,000	14.2/1,000

Through the State's TPR and the Urban Growth Boundaries, local jurisdictions are required to adopt these standards. Metro's Urban Growth Management Functional Plan sets region-wide limits on parking.

Metro has promoted shared parking as a strategy to better manage parking supply and demand. Under a study that was conducted for Metro a survey listed the following existing/suggested combinations for shared parking:

- Movies/Office
- Health Club/Office
- Restaurant/Office
- Retail/Office/Restaurant/Residential
- Cinema/Church/Retail
- Church/School
- Retail/Restaurant/Bank
- Retail Medical Office
- Medical Office /Health Club
- Seasonal & Special Events/Throughout District
- Combinations that are less likely to work:
- Office/Retail
- Industrial and non-industrial

#### *Summary of Key Findings*

- There may be future opportunities for certain land uses to lower parking requirements.
- In some cases, the parking caps appear to be having a restraining impact on parking supplies.
- Need to reduce the number or growth of non-residential parking spaces.

## *Aspen, Colorado*

This parking management project received the ECO award from the United States Environmental Protection Agency (USEPA). The City of Aspen has utilized parking pricing strategies to encourage the use of alternative modes of transportation and improve the streetscape aesthetics. The program was created to address limited parking resources and to meet increasing parking demand while maintaining livable community standards.

### *Parking Goals and Issues*

- Manage parking supply more efficiently.
- Encourage use of alternative modes of transportation.
- Improve streetscape aesthetics (eliminates street striping and reduces number of meters).
- Address neighborhood parking spillover issues.
- Free up parking spaces for customers.

### *Parking Management Strategies*

- Pay and Display Parking System (on-street).
- Encourage use of off-street parking and/or long-term parking.
- Provide transportation alternatives.

### *Key Strategies*

In January 1995, the City of Aspen implemented a "Pay and Display" parking system. This system allows the motorist to pay at one location and display a ticket on the dash board of the car as proof of payment. One machine can control 15 to 20 spaces and eliminate the need for multiple meters. Fewer parking machines and no marked parking spaces has enhanced the aesthetic environment of Aspen. In addition, with no marked spaces, the city estimates that there is a ten percent increase in the parking supply. The use of the parking spaces is limited by time constraints. Enforcement is accomplished by checking the ticket on the dashboard.

The machines accept coins, tokens and "smart cards". This offers visitors and residents flexibility in payment for parking. A survey found that 71 percent of the residents supported the program.

Pay and display is used in the commercial core. All-day parking is available in a parking structure at \$7.50 per day.

Carpoolers can receive free parking through a permit or by stopping at a "parking kiosk". Aspen's transportation plan is closely coordinated with the parking program. Carpool assistance, and information about transit are available. Park and ride lots are connected to the city's transit system. The City of Aspen also uses discounted seasonal passes, residential permits, guest permits and residential and carpool zoning to maximize use of parking resources.

### *Summary of Key Findings*

- Increased parking revenues.
- Improved streetscape aesthetics.
- Incentives to encourage use of alternative modes of transportation (free parking for carpoolers).

### ***Olympia, Washington***

The City of Olympia has utilized parking management strategies as a part of the development process to encourage Livable Communities concepts. This includes a 1994 parking utilization study, establishment of a parking/TDM committee and changing parking requirements to make better use of parking resources. Current efforts include developing a demand-based parking management/TDM program to create development oriented parking policies and tenant-based parking/TDM strategies.

The City of Olympia is the capitol of Washington and approximately 90% of the office use involves the State of Washington. The State supports parking pricing and commute options to reduce parking demand at state facilities. Since 1995, the State restricts the amount of parking a state agency can lease and allows agencies to charge its employees for parking. This project requires participation by state and local jurisdictions, resulting in the formation of a coalition of the state, 3 cities and the local transit agency in the Port of Olympia.

### *Parking Goals and Issues*

- Reduce traffic congestion.
- Maintain adequate parking supply.
- Provide accessible and appealing off-site parking facilities.
- Mitigate traffic impacts on neighborhoods.
- Encourage increased densities for commercial areas.
- Encourage the development of a comprehensive plan that includes parking management and transportation demand management strategies.

### *Parking Management Strategies*

- Area-wide parking supply levels that allow for exemptions or reductions on parking requirements.
- Parking Ratios under a variance procedure allow for a 40 percent reduction or increase in parking within the Downtown core and 10 percent for other areas.
- Bicycle parking based upon the number of automobile stalls.
- Parking pricing (development and tenant based pricing strategies). The city charged for parking in public lots. Employees were encouraged to park in this long-term parking lot in order to free prime spaces for customers and use transit.
- 90 minute Time Limits on "Blue Zone"(Free Parking).

### *Summary of Key Findings*

- The importance of parking as an element of Livable Communities. The need to effectively manage parking supply and demand.
- More efficient use of parking supply by reducing parking requirements and using land for the highest and best use.
- Using parking management to promote economic vitality.

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